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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,937	10/16/2003	Bin Wu	KCX-692 (19490)	4594
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ARNOLD, ERNST V				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/686,937

**Applicant(s)**

WU ET AL.

**Examiner**

ERNST V. ARNOLD

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 and 7-60 is/are pending in the application.
- 4a) Of the above claim(s) 31-60 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date 11/02/07.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application.
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

Claim 6 has been cancelled. Claims 31-60 have been withdrawn. Claims 1-5 and 7-30 are under examination. Applicant filed a new IDS on 11/02/07 which necessitated the new ground of rejection. Accordingly, this action is FINAL.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5 and 7-30 remain/are rejected under 35 U.S.C. 103(a) as being unpatentable over Stoddart et al. (EP 1214878A1) in view of Harada et al. (US 6,410,616) and Forestier et al. (US 6,001,342) and Zenner et al. (US 4,959,135) and, with respect to claims 8-12 and 24, Sebag et al. (US 4,275,054) and, with respect to claims 13-16 and 26-28, Connolly (US 5,120,693).

Applicant claims a method for reducing odor comprising forming a coordination complex between a transition metal and a polydentate compound where said polydentate compound is a polyalkylimine and contacting said coordination complex with an odorous compound.

**Determination of the scope and content of the prior art**

**(MPEP 2141.01)**

Stoddart et al. disclose methods to control undesirable odors such as ammonia that utilize certain urease inhibitor complexes formed from a divalent metal ion and a polyanionic, preferably amine based, chelating agent (Abstract). A preferred complex used in the method is the copper salt of N-hydroxyethyl-ethylenediamine-triacetic acid (Cu-HEDTA), which is brought into contact with the body fluids ([0005], [0006], [0017-0022] and claims 2 and 5). Reactant concentrations may be limited by their solubility in the reaction mixture ([0016]). The Examiner interprets this to mean that the chelating agent is water-soluble. The composition can be combined with pet litter, which comprises high surface area particles such as various clays and ([0035]). The composition can be utilized in a wide variety of articles and devices such as wiping clothes, diapers (which are comprised of cellulose fibers) and paper towels where the composition is absorbed into, adsorbed onto or chemically linked or bonded to the substrate ([0039-0042]). A bis-epoxide can be used to link HEDTA to cotton ([0043] and [0056]).

Zenner et al. teach polyalkylamine complexes with transition metal ions such as manganese, iron, cobalt, copper and vanadium, for ligand extraction (title; Abstract and claims 1-11; for example). Zenner et al. thus establish that polyalkylamine complexes with transition

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metal ions can bind small molecules (column 8, lines 34-41). Zenner et al. teach collecting ligands to maintain a low partial pressure of the ligand and removal of the ligands (column 34, lines 6-27). Zenner et al. does not specifically teach small molecules that are odorous compounds or a method for reducing odor.

Forestier et al. teach a deodorant composition comprising at least one dendrimer bearing a primary amine group, which can be a polyalkylamine, and methods of use (Abstract and claims 1-15). The methods include contacting the composition to the underarm area (Claim 15). The dendrimers can be selected from polyethyleneimines, which can have positively charged amino groups, and polypropyleneimines (Column 3, lines 55-62). The deodorant compositions can also contain active agents such as water-soluble zinc salts (Column 4, lines 23-34). A method of using the composition to inhibit the development of odors derived from sweat, a component is ammonia, is taught by Forestier et al. (Column 6, Example 1). Forestier et al. teach that the composition can find application in the fields of textiles and litters for animals (Column 6, lines 1-5).

Harada et al. teach compositions comprising polyethylenimine, polyalkylenimine (column 3, lines 45-55 and column 9, lines 11-13) and 0.01 to 30 wt% crosslinking reagents including the transition metals iron and zinc (column 4, lines 29-67) for use as deodorants (column 10, lines 17-19).

Sebag et al. teach deodorant compositions comprising cationic polymers such as polyethyleneimines (Column 4, lines 37-42; Column 15, Table 1, number 7 and claims 1 and 2). Sebag et al. teach crosslinking is effected with a crosslinking reagent selected from the group consisting of epihalohydrins, diepoxides, dianhydrides, unsaturated anhydride and the bis

unsaturated derivatives and provide several examples using epichlorohydrin (Column 3, lines 25-30 and Column 8, Example Ia, for example).

Connolly et al. teach agglomerates of zeolitic molecular sieves which are bonded with particles of spherical amorphous colloidal-sized silica particles having nominal diameters in the range of 40 to 800 nanometers which are ideally suited for use in odor elimination (Abstract).

### **Ascertainment of the difference between the prior art and the claims**

#### **(MPEP 2141.02)**

1. While Applicant claims a method for reducing odor comprising forming a coordination complex between a transition metal and a polydentate compound where said polydentate compound is a polyalkylimine and contacting said coordination complex with an odorous compound, Stoddart et al. do not expressly teach wherein the polydentate compound is a polyalkylimine such as polyethyleneimine, polypropyleneimine or a dendrimer thereof. This deficiency in Stoddart et al. is cured by the teachings of Zenner et al., Harada et al., Forestier et al. and Sebag et al.

2. While Applicant claims a method for reducing odor further comprising combining high surface area particles with said transition metal and said polydentate compound wherein said particles have an average size of less than about 100 nm and a surface area of from about 50 to about 1000 square meters per gram and have a negative zeta potential, Stoddart et al. teach high surface area particles but does not disclose the exact dimensions of said particles. This deficiency in Stoddart is cured by the teachings of Connelly et al.

**Finding of prima facie obviousness**

**Rational and Motivation (MPEP 2142-2143)**

1. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use a coordination complex between a transition metal and a polydentate compound where said polydentate compound is a polyalkylimine, as suggested by Zenner et al., Harada et al, Forestier et al. and Sebag et al., in the method of Stoddard and produce the instant invention.

One of ordinary skill in the art would have been motivated to do this because Stoddard et al. provides the basic principle that metal-amine coordination complexes can be used to reduce odors. Zenner et al. provide the nexus teaching that metal-polyalkylamine coordination complexes bind molecules and lower their concentration. Forestier et al. and Sebag et al. are relied upon for their teachings of the types of polyalkylimines and crosslinking and Harada et al. teach that these types of compositions are useful as deodorants. Based upon these teachings, one of ordinary skill in the art would expect a composition of a transition metal and a polyalkylimine to capture an odorous molecule on the metal and serve as a deodorant. It is the Examiner's position, in the absence of evidence to the contrary, that the polydentate polyalkylimine compounds can have positively charged groups and are water-soluble.

2. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use the particles taught by Connelly et al. in the method of Stoddard et al. and produce the instant invention.

One of ordinary skill in the art would have been motivated to do this because Stoddard et al. provides the basic concept of using high surface area particles with the chelate and

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Connelly et al. fills in the types of particles to use. In the absence of evidence to the contrary the particles would have a negative zeta potential and meet the surface area limitation. Please note that the USPTO is not equipped with the analytical equipment to measure each and every parameter such as zeta potential and surface area of the particles. Since the particles appear to be the same as instantly claimed, then the burden is then placed on Applicant to demonstrate otherwise. Objective evidence of nonobviousness, if any, must be commensurate in scope with that of the claimed subject matter. *In re Kulling*, 14 USPQ2d 1056 (Fed. Cir. 1990); *In re Lindner*, 173 USPQ 356 (CCPA 1972).

**Summary:** The art teaches that polyalkylamine metal coordination complexes (amine based chelating agent) can bind molecules and thus lower their concentration. The art teaches methods of controlling odors by contacting the odorous material with a divalent metal ion and a preferably amine based chelating agent thus teaching metal-amine chelating agents for use in controlling odors. The art teaches polyethyleneimine (a polyalkylamine which is an amine based chelating agent) for use in deodorant compositions. The art also teaches cross-linked polyethyleneimines with transition metals (see Harada et al.) for use in deodorant compositions. The Examiner concludes that all the essential elements are taught in the art for one of ordinary skill in the art to arrive at the instant invention because it would be obvious to use metal amine based chelation compounds, such as metal polyalkylimine metal coordination complexes, to remove odorous molecules and thus reduce odor in the absence of evidence to the contrary.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill in the art might reasonably infer from the teachings. (*In re Opprecht* 12 USPQ 2d 1235, 1236 (Fed Cir. 1989); *In re Bode* 193 USPQ 12 (CCPA) 1976).



In light of the forgoing discussion, the Examiner concludes that the subject matter defined by the instant claims would have been obvious within the meaning of 35 USC 103(a).

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

**Response to arguments:**

Applicant asserts that the metal center of Stoddard is only good for binding urease and one of ordinary skill in the art would not expect it to bind another molecule and therefore there is no motivation to combine the references. Respectfully, the Examiner cannot agree. This argument is not persuasive. One of ordinary skill in the art of transition metal chemistry understands that the metal center cannot discriminate against ligands. The compound of Stoddard may bind urease but it is also fully capable of binding other molecules as well. Furthermore, the newly supplied reference of Harada et al. teaches that polyalkylenimines cross linked with iron or zinc can be used as deodorants. The Examiner can only conclude that one of ordinary skill in the art would expect a composition of a transition metal and a polyalkylimine to capture an odorous molecule on the metal and serve as a deodorant.

***Conclusion***

No claims are allowed.

Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 11/02/07 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ernst V. Arnold whose telephone number is 571-272-8509. The examiner can normally be reached on M-F (6:15 am-3:45 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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